

AMENDMENTS TO THE CLAIMS

1-21. (Cancelled)

22. (New) A wireless communication system comprising:

a master station, which is a wireless access unit for managing access to a wireless network; and

at least one slave station, which is one or more other wireless access units;

wherein said master station and said at least one slave station are on the wireless network in which data is at least one of transmitted between said master station and said at least one slave station, and transmitted between said at least one slave station and another slave station by using at least one of:

a constant bit rate communication type which is constant in transmission speed and data period;

a variable bit rate communication type which is variable in transmission speed and constant in data period;

an available bit rate communication type which is constant in transmission speed and variable in data period; and

an unspecified bit rate communication type which is variable in transmission speed and data period;

wherein said master station comprises:

a scheduler for performing scheduling by regularly determining a transmission band assignment including information regarding a transmission timing of the data, a transmission amount, and whether said master station or any one of said at least one slave station is allowed to access said wireless access system; and

means for providing said scheduler with communication parameters for the data transmission which are needed by each of the communication types in order to make a request for setting a communication link for data transmission, the communication parameters including at least one of a part and an entire transmission amount, transmission speed, data period and priority;

wherein said at least one slave station comprises means for providing said scheduler with a communication parameter for the data transmission which are needed by each of the communication types by transmitting communication parameters for the data transmission to said master station by using a request packet in order to make the request for setting the communication link for data transmission, the communication parameters including at least one of a part and an entire transmission amount, transmission speed, data period and priority;

wherein said master station further comprises means for giving the transmission band assignment scheduled by said scheduler to said at least one slave station by using a band assignment and recognizing the transmission band assignment;

wherein a transmitting station and a receiving station between which the communication link is set by the transmission band assignment carry out bi-directional data transmission according to the transmission band assignment;

wherein said transmitting station is at least one of said master station and said at least one slave station which sends the data, and said receiving station is at least one of said master station and said at least one slave station which receives the data;

wherein the communication type indicated by the communication parameter is at least one of the constant bit rate communication type, the variable bit rate communication type and the available bit rate communication type;

wherein said scheduler comprises calculation means for calculating a difference T_b between at least one of a present time and a reference time, and a time when data transmission on each communication link has been completed, and for determining when the difference T_b is positive for each communication link;

wherein when the difference T_b is positive for each communication link, said calculation means

calculates a difference V_{dd} between a data amount parameter included in the communication parameter and indicating an amount of data to be transmitted and an amount of data already received by said receiving station,

calculates a priority value by subtracting an overhead bandwidth from an entire transmission bandwidth of said system so as to obtain an effective transmission bandwidth, multiplying the effective transmission bandwidth the

difference T_b so as to obtain a value, then dividing the calculated difference V_{dd} by the obtained value, and

selects at least one communication link whose priority value is not less than a predetermined value and predetermined in decreasing order or whose priority value is not less than a random number generated within a predetermined range as the communication link which is assigned the transmission band; and wherein when the difference T_b is not positive for each communication link, said calculation means selects at least one communication link in increasing order of the difference T_b as the communication link which is assigned the transmission band.

23. (New) The wireless communication system according to claim 22, wherein said scheduler comprises means for updating the received data amount of each communication link based on an acknowledgment packet indicating a state as to whether or not data transmitted from said receiving station has been correctly received in the communication link.

24. (New) The wireless communication system according to claim 22, wherein said scheduler comprises means for updating the received data amount of each communication link by using the transmission amount determined by the transmission band and assignment, and correcting the received data amount to an effective value based on an acknowledgment packet indicating a state as to whether or not data transmitted from said receiving station has been correctly received in the communication link.

25. (New) The wireless communication system according to claim 22, wherein when the difference V_{dd} of the communication link for scheduling is negative, said scheduler comprises means for carrying out operations including at least one of deleting a setting of the communication link, resetting the communication link by the communication parameter currently being used, and resetting the communication link with the communication type being changed to the unspecified bit rate communication type.

26. (New) The wireless communication system according to claim 22, wherein when the communication type indicated by the communication parameter is the unspecified bit rate communication type, said scheduler comprises means for carrying out the transmission band assignment according to at least one of an order in which the communication link has been set and a priority order of the priority parameter included in the communication parameter.

27. (New) The wireless communication system according to claim 26, wherein when a period parameter indicating a data period is further provided, said scheduler comprises means for calculating a difference T_b between at least one of a present time and a reference time, which is a transmission time of the assigned transmission band, and a time when data transmission on each communication link has been completed, and carrying out transmission band assignment only when the difference T_b is not more than zero.

28. (New) The wireless communication system according to claim 22, wherein said master station comprises means for giving, to said at least one slave station, the band assignment packet with a probability parameter for access control of the request packet added thereto, and

said at least one slave station comprises means for transmitting the request packet only when the given probability parameter exceeds a random number generated within a range of values which the probability parameter can take.

29. (New) The wireless communication system according to claim 22, wherein said master station comprises means for transmitting, to said at least one slave station, the band assignment packet with a transmission time stamp value indicating a transmission time added thereto, and

said at least one slave station comprises means for synchronizing a time counter of said at least one slave station with a time counter of said master station by using the transmission time stamp value transmitted from said master station.

30. (New) The wireless communication system according to claim 22, wherein said at least one slave station comprises means for transmitting, to said master station, the request packet with a transmission stamp value indicating a transmission time added thereto,

said master station comprises means for calculating a space propagation delay time from a difference between a receive time and the transmission time stamp value when receiving the request packet with the transmission time stamp value added thereto, and for giving, to said at least one slave station, the band assignment packet indicating an adjusted value according to the space propagation delay time, and

said at least one slave station comprises means for correcting transmission timings of the request packet and the data packet according to the given adjusted value.

31. (New) The wireless communication system according to claim 22, wherein said receiving station which is indicated by a destination of the band assignment packet comprises

means for, when receiving the band assignment correctly, carrying out intermittent receiving in timing when the data packet transmitted from said transmitting station and the band assignment packet which is transmitted next from said master station are received, and

means for, when not receiving the band assignment correctly, carrying out intermittent receiving only after receiving the band assignment which is transmitted next correctly.

32. (New) A wireless communication system comprising:

a master station, which is a wireless access unit for managing access to a wireless network; and

at least one slave station, which is one or more other wireless access units;

wherein said master station and said at least one slave station are on the wireless network in which data is at least one of transmitted between said master station and said at least one slave station, and transmitted between said at least one slave station and another slave station by using at least one of:

a constant bit rate communication type which is constant in transmission speed and data period;

a variable bit rate communication type which is variable in transmission speed and constant in data period;

an available bit rate communication type which is constant in transmission speed and variable in data period; and

an unspecified bit rate communication type which is variable in transmission speed and data period;

wherein said master station comprises a scheduler operable to perform scheduling by regularly determining a transmission band assignment including information regarding a transmission timing of the data, a transmission amount, and whether said master station or any one of said at least one slave station is allowed to access said wireless access system, said scheduler being provided with communication parameters for the data transmission which are needed by each of the communication types in order to make a request for setting a communication link for data transmission, the communication parameters including at least one of a part and an entire transmission amount, transmission speed, data period and priority;

wherein said at least one slave station is operable to provide said scheduler with a communication parameter for the data transmission which are needed by each of the communication types by transmitting communication parameters for the data transmission to said master station by using a request packet in order to make the request for setting the communication link for data transmission, the communication parameters including at least one of a part and an entire transmission amount, transmission speed, data period and priority;

wherein said master station is operable to give the transmission band assignment scheduled by said scheduler to said at least one slave station by using a band assignment and recognizing the transmission band assignment;

wherein a transmitting station and a receiving station between which the communication link is set by the transmission band assignment are operable to carry out bi-directional data transmission according to the transmission band assignment;

wherein said transmitting station is at least one of said master station and said at least one slave station which sends the data, and said receiving station is at least one of said master station and said at least one slave station which receives the data;

wherein the communication type indicated by the communication parameter is at least one of the constant bit rate communication type, the variable bit rate communication type and the available bit rate communication type;

wherein said scheduler comprises a calculation unit operable to calculate a difference T_b between at least one of a present time and a reference time, and a time when data transmission on each communication link has been completed, and to determine when the difference T_b is positive for each communication link;

wherein when the difference T_b is positive for each communication link, said calculation unit is operable to

calculate a difference V_{dd} between a data amount parameter included in the communication parameter and indicating an amount of data to be transmitted and an amount of data already received by said receiving station,

calculate a priority value by subtracting an overhead bandwidth from an entire transmission bandwidth of said system so as to obtain an effective transmission bandwidth, multiplying the effective transmission bandwidth the difference T_b so as to obtain a value, then dividing the calculated difference V_{dd} by the obtained value, and

select at least one communication link whose priority value is not less than a predetermined value and predetermined in decreasing order or whose priority value is not less than a random number generated within a predetermined range as the communication link which is assigned the transmission band; and

wherein when the difference T_b is not positive for each communication link, said calculation unit is operable to select at least one communication link in increasing order of the difference T_b as the communication link which is assigned the transmission band.

33. (New) The wireless communication system according to claim 32, wherein said scheduler is operable to update the received data amount of each communication link based on an acknowledgment packet indicating a state as to whether or not data

transmitted from said receiving station has been correctly received in the communication link.

34. (New) The wireless communication system according to claim 32, wherein said scheduler is operable to update the received data amount of each communication link by using the transmission amount determined by the transmission band and assignment, and to correct the received data amount to an effective value based on an acknowledgment packet indicating a state as to whether or not data transmitted from said receiving station has been correctly received in the communication link.

35. (New) The wireless communication system according to claim 32, wherein when the difference V_{dd} of the communication link for scheduling is negative, said scheduler is operable to carry out operations including at least one of deleting a setting of the communication link, resetting the communication link by the communication parameter currently being used, and resetting the communication link with the communication type being changed to the unspecified bit rate communication type.

36. (New) The wireless communication system according to claim 32, wherein when the communication type indicated by the communication parameter is the unspecified bit rate communication type, said scheduler is operable to carry out the transmission band assignment according to at least one of an order in which the communication link has been set and a priority order of the priority parameter included in the communication parameter.

37. (New) The wireless communication system according to claim 36, wherein when a period parameter indicating a data period is further provided, said scheduler is operable to calculate a difference T_b between at least one of a present time and a reference time, which is a transmission time of the assigned transmission band, and a time when data transmission on each communication link has been completed, and to carry out transmission band assignment only when the difference T_b is not more than zero.

38. (New) The wireless communication system according to claim 32, wherein said master station is operable to give, to said at least one slave station, the band assignment packet with a probability parameter for access control of the request packet added thereto, and

said at least one slave station is operable to transmit the request packet only when the given probability parameter exceeds a random number generated within a range of values which the probability parameter can take.

39. (New) The wireless communication system according to claim 32, wherein said master station is operable to transmit, to said at least one slave station, the band assignment packet with a transmission time stamp value indicating a transmission time added thereto, and

said at least one slave station is operable to synchronize a time counter of said at least one slave station with a time counter of said master station by using the transmission time stamp value transmitted from said master station.

40. (New) The wireless communication system according to claim 32, wherein said at least one slave station is operable to transmit, to said master station, the request packet with a transmission stamp value indicating a transmission time added thereto,

said master station is operable to calculate a space propagation delay time from a difference between a receive time and the transmission time stamp value when receiving the request packet with the transmission time stamp value added thereto, and to give, to said at least one slave station, the band assignment packet indicating an adjusted value according to the space propagation delay time, and

said at least one slave station is operable to correct transmission timings of the request packet and the data packet according to the given adjusted value.

41. (New) The wireless communication system according to claim 32, wherein said receiving station which is indicated by a destination of the band assignment packet is operable to,

when receiving the band assignment correctly, carry out intermittent receiving in timing when the data packet transmitted from said transmitting station and the band assignment packet which is transmitted next from said master station are received, and

when not receiving the band assignment correctly, carry out intermittent receiving only after receiving the band assignment which is transmitted next correctly.